

What is claimed is:

1. A plate for forming metal wires, comprising:
 - 5 a plate in which a plurality of implantation holes are formed and a sidewall of a given height is formed at its edge;
 - an engraved pattern for forming a plurality of trenches formed on the plate; and
 - an engraved pattern for forming a plurality of via holes formed on the
 - 10 engraved pattern for forming the trenches.
2. The plate as claimed in claim 1, wherein the plate is circular.
3. The plate as claimed in claim 1, wherein the plate is made of Ti,
 - 15 Ta, W, nitrogenous compound of a metal, Al_2O_3 or ceramics.
4. A method of forming metal wires, comprising the steps of:
 - a) forming a low-dielectric insulating film on a silicon substrate for which given processes are implemented, and then forming a trench in the low-
 - 20 dielectric insulating film;
 - b) forming lower metal wires within the trench;
 - c) adhering a plate having a plate in which a plurality of implantation holes are formed and a sidewall of a given height is formed at its edge, an engraved pattern for forming a plurality of trenches formed on the plate, and

an engraved pattern for forming a plurality of via holes formed on the engraved pattern for forming the trench, onto a silicon substrate;

d) implanting a low-dielectric insulating material through the implantation holes and then annealing the low-dielectric insulating material;

5 e) removing the plate to obtain a low-dielectric insulating film pattern having the plurality of the trenches shaped by the engraved pattern for forming the trenches and the plurality of the via holes shaped by the engraved pattern for forming the via holes; and

f) forming upper metal wires, which are connected to the lower metal
10 wires through the via holes, within the trenches.

5. The method as claimed in claim 4, further comprising the step of forming an anti-diffusion film on the surface of the lower metal wires from the step b).

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6. The method as claimed in claim 5, wherein the anti-diffusion film is made of a metal of a high melting point or a compound of Ni, Co, P and B, and is formed by a selective electroless plating method.

20 7. The method as claimed in claim 4, wherein in the step d), the silicon substrate and the plate are kept at a temperature of 100 ~ 450 °C.

8. The method as claimed in claim 4, wherein the low-dielectric insulating material is made of a material containing carbon or an organic or

inorganic series material of a low density and is implanted in thickness of 3000 ~ 30000 Å.

9. The method as claimed in claim 4, wherein the annealing
5 process is implemented for 10seconds ~ 10minutes.

10. The method as claimed in claim 4, further comprising the step
of forming an anti-diffusion film on the surface of the upper metal wires from
the step f).

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11. The method as claimed in claim 4, wherein the upper and lower
metal wires consist of an anti-diffusion film and a copper film, and is formed
by a damascene process.

15 12. The method as claimed in claim 11, wherein the anti-diffusion
film is made of Ta, TaN, TiN, TiNSi, WN, WCN, or an alloy of their
combination, and is formed by a physical vapor deposition method, a chemical
vapor deposition method or an atomic layer deposition method.

20 13. The method as claimed in claim 11, wherein the copper film is
formed by electroplating, electroless plating or chemical vapor deposition
method.

14. A plate for forming metal wires, comprising:

a plate in which a plurality of first and second implantation holes are each formed and a sidewall of a given height is formed at its edge;

an engraved pattern for forming a plurality of trenches formed on the plate; and

5 an engraved pattern for forming a plurality of via holes formed on the engraved pattern for forming the trenches.

15. The plate as claimed in claim 14, wherein the first and second implantation holes are formed with uniform distribution so that an insulating
10 material is buried in a uniform thickness, and are discriminated so that insulating materials of different kinds are each implanted.

16. The plate as claimed in claim 14, wherein the plate is made of Ti, Ta, W, nitrogenous compound of a metal, Al_2O_3 or ceramics.

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17. A method of forming metal wires, comprising the steps of:

a) forming a low-dielectric insulating film on a silicon substrate for which given processes are implemented and then forming a trench in the low-dielectric insulating film;

20 b) forming lower metal wires within the trench;

c) adhering a plate having a plate in which a plurality of first and second implantation holes are each formed and a sidewall of a given height is formed at its edge, an engraved pattern for forming a plurality of trenches formed on the plate, and an engraved pattern for forming a plurality of via holes formed

on the engraved pattern for forming the trench, onto a silicon substrate;

d) implanting a first insulating material of a given amount through the first implantation hole;

e) implanting a second insulating material through the second
5 implantation hole;

f) removing the plate to obtain an insulating film pattern of a multi-layer structure having the plurality of the trenches shaped by the engraved pattern for forming the trenches and the plurality of the via holes shaped by the engraved pattern for forming the via holes; and

10 g) forming upper metal wires, which are connected to the lower metal wires through the via holes, within the trenches.

18. The method as claimed in claim 17, wherein the second insulating material is made of an inorganic series material having a dielectric
15 of 2.0 ~ 4.5 capable of serving as an anti-polishing layer.

19. The method as claimed in claim 17, wherein the annealing processes in the steps d) and e) are implemented for 10seconds ~ 10minutes under an inert gas atmosphere of over 1 atmospheric pressure.